NIEMEYER
AGRARTECHNIK

Operating Instructions

CE

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DRS-High Performance Rake

TWIN 715-S
TWIN 745-VS
TWIN 850-VS

These Operating Instructions contain valuable and important information. Please read them before using the implement and note the various comments and hints for a proper and relibale operation.

Store these instructions in a safe place for future referance. Every user of the high-performance rake must first familiarize himself or herself with the contents before beginning work.

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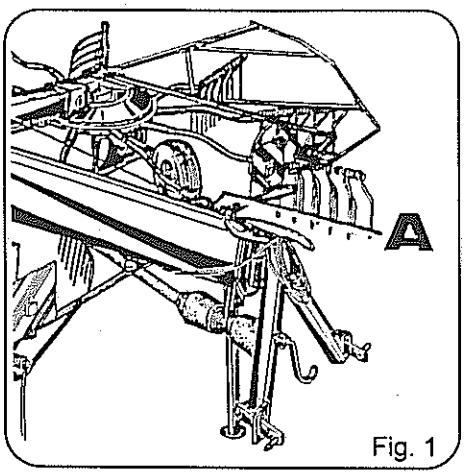


Fig. 1

Each machine is provided with a serial plate (see fig. 1, pos. A) which contains details of the model (fig. 2, pos. C) serial number (fig. 2, pos. D) and year of manufacture (fig. 2, pos. E).

This information must be communicated for costumer service or when reordering spare parts.

The weight given on the identification plate gives an indication of the type of lifting appliance required to raise the machine. The actual weight can be greater due to the addition of accessories.

Pos. F = Direction of rotation of the power take-off in driving direction, right (clockwise)

Pos. H = The maximum driving speed of the motor given for the tractor power take-off shaft may not be exceeded.

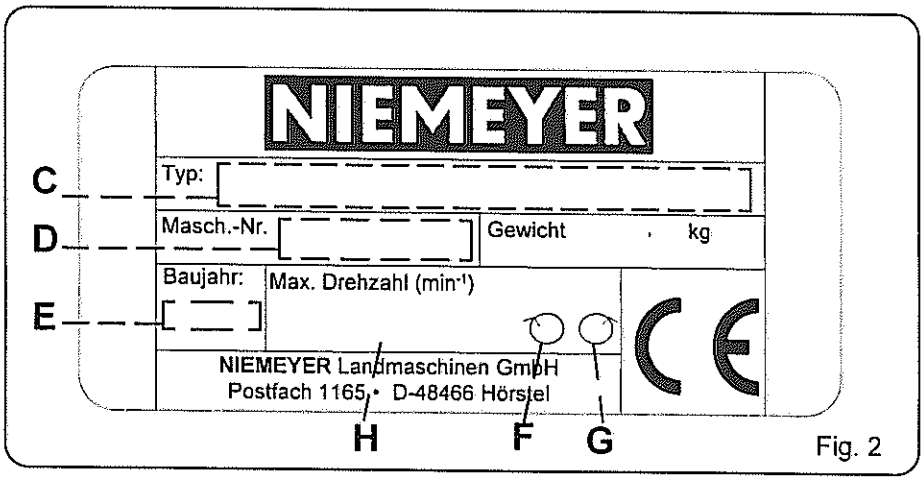


Fig. 2

Scope of Delivery

1 DRS-High-performance rake TWIN 715-S

1 operating instruction
1 EC Declaration of Compliance

1 High-performance rake TWIN 745-VS

1 operating instruction
1 EC Declaration of Compliance

1 High-performance rake TWIN 850-VS

1 operating instruction
1 EC Declaration of Compliance

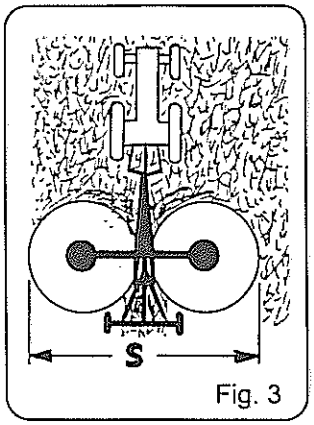


Fig. 3

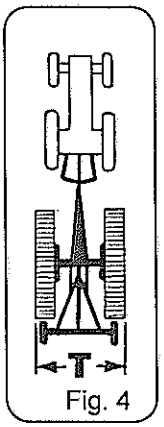


Fig. 4

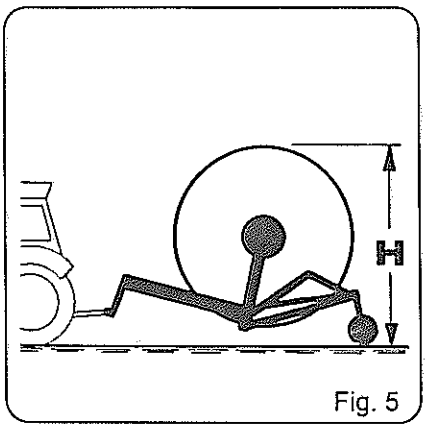


Fig. 5

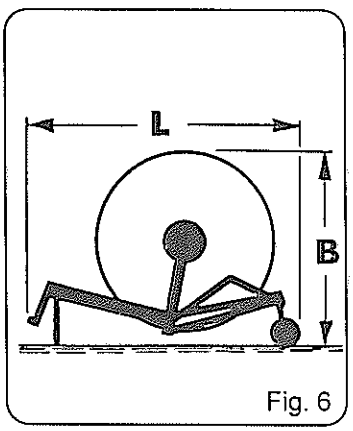


Fig. 6

Technical Data

1. Machine(s):	TWIN 715-S	TWIN 745-VS	TWIN 745-VS
Weight approx.* ..... kg basic machine	1560	1660	1870
Max. permissible drive speed ..... rpm (opening-speed of the pto-shaft)	540	540	540
Working width approx. (Fig. 3, pos. S)..... m	6,90	6,70 - 7,40	7,50 - 8,40
Transport width approx. (Fig. 4, Pos. T) ..... m	2,50	2,50	2,80
Transport height approx. (Fig. 5, Pos. H)***..... m	3,40	3,35	3,75**
Storage height approx. (Abb. 6, pos. B)*** ..... m	3,40	3,35	3,75
Storage length approx. (Abb. 6, pos. L) ..... m	4,35	4,35	5,10
Max. hydraulic system pressure ..... bar	210	210	210
Noise emission-value L_{PA} .....db(A)	< 70	< 70	< 70
Area capacity up to approx. ..... ha/h	11,5	11,3 - 13,0	13,3 - 14,6
2. Tractor:			
Min. power requirement approx. ..... kW (bhp) (Engine power)	30 (40)	30 (40)	37 (50)
Rear-three point mounting ..... CAT after ISO 730 or DIN 9674	2	2	2
Pto-shaft speed ..... rpm	540	540	540
Pto-shaft direction ..... (right to ISO 500 or DIN 9611)	right	right	right
Hydraulic system pressure ..... bar (Permanent working pressure according to DIN 9679)	160	160	160

* The stated weights can be increased by using additionals parts.
** Fold outer safety guards
*** Main frame lowered

Safety instructions

We have indicated all those instances in these operating instructions involving your safety with this symbol. Please let other users also know about all these safety instructions.

Proper Use

The high performance rake may only be used for the purposes intended (to handle mown straw lying on the ground). Otherwise the manufacturer accepts no liability whatsoever for resulting damage. Any other or additional use, such as raking together of pieces of wood, is considered not to be proper use. Use of the machine in accordance with its intended purpose also includes observance of operating conditions specified by the manufacturer and the undertaking of necessary care and maintenance work at the specified intervals.

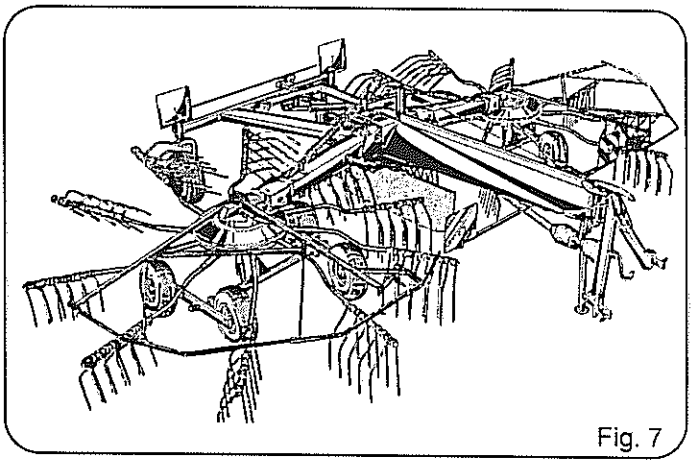


Fig. 7

The high-performance rake may be used, serviced and repaired only by persons who are familiar with such work and aware of the hazards involved. The relevant accident prevention regulations and all other generally recognized technical saftey, occupational saftey and road traffic regulations must be complied with.

Road traffic regulations may stipulate that all machines are equipped with lighting when being transported on public roads and highways.

Basic rule

Please read the operating and safety instructions prior to initial start-up (see warning symbol on page 20, pos. C).

Check the implement for operation and road safety before each use.

Safety and Accident Prevention Regulations

General

As well as these Operating Instructions, also observe the generally valid safety and accident prevention regulations.

1. As well as this Operating Instruction, also observe the generally valid safety and accident prevention regulations.
2. The attached warning signs and notices provide important information for safe operation; observance of these instructions contained on them is for your own safety!
3. When using public roads, observe all local road traffic regulations.
4. Before beginning work, familiarize yourself with all the features and control elements of the machine and their functions. It is too late to do this during operation !
5. The user's clothing should be tight-fitting. Avoid loose-fitting clothing!
6. To prevent the risk of fire, keep the machine clean!
7. Before the machine is lifted and the tractor sets off, check the immediate vicinity. Make sure you have sufficient visibility and watch out for children!
8. The carrying of passengers on the machine when working or in transit is not permitted.
9. Hitch the machine in accordance with regulations and only attach and secure it to the appliances for which it is intended.
10. When hitching and unhitching, set the support components to the appropriate positions! (stability!)
11. Particular care and attention is required when hitching and unhitching appliances to and from the tractor!
12. Always mount ballast weights in accordance with regulations and at the securing points provided!
13. Observe permissible axle loads and maximum laden weights!
14. Observe permissible transport dimensions!
15. Check and affix the necessary transport equipment, such as lighting, hazard warning signs and protective devices and guards!
16. Operating elements (cables, chains, linkages etc.) of remote-controlled devices must be aligned in such a way that they do not cause unintentional motion in any transit or working positions!
17. Make sure that the machine is in the specified condition for road travel, and secure it in accordance with manufacturer's regulations!
18. Never leave the driver's station whilst the machine is in motion!
19. The running speed of the machine must always be adapted to the environmental conditions! Avoid sudden cornering movements when driving up or down hill, or when driving transverse to the slope of the hill!
20. The handling, steering and braking characteristics of the tractor are affected by hitched machinery and ballast weights! You should therefore make sure of sufficient steerability and braking capability!
21. When cornering, take into account the overhang and the centrifugal mass of the machine!

22. Keep away from the working area and the danger areas of the machine!

23. Keep away from the rotating and swivelling areas of the machine!

24. Danger of crushing and shearing on (hydraulically) powered components!

25. Secure the machine before leaving the tractor! Fully lower all hitched appliances! Turn off the engine and remove the ignition key!

26. No one must enter the area between the tractor and the machine unless the vehicle is secured against rolling by means of the parking brake and/or chocks.

27. Where, when fitted with front-mounted appliances, the front mounting dimension of 3.5 m (measured from the center of the steering wheel to the front point of the machine) is exceeded, the operator must ensure that the restricted field of vision when exiting from farmyards, pulling onto roads and at crossroads is compensated by suitable measures. This may be achieved, for example, by an accompanying person acting as lookout for the driver in such situations.

Hitched appliances

1. Before hitching and unhitching to and from the three-point linkage, set the operating device to a position which guards against unintentional raising or lowering!

2. In three-point hitching, it is essential that the hitching categories of the tractor and the machine be identical or adapted to each other!

3. There is risk of injury resulting from crushing and shearing in the vicinity of the three-point linkage!

4. When the external control for the three-point hitching is operated, do not enter the area between the tractor and the machine!

5. In the transit position of the machine, always ensure sufficient lateral arresting of the tractor three-point linkage!

6. When driving on the road with the machine lifted, the operating lever for the three point hydraulic must be secured against lowering!

Towed machinery

1. Secure the machines against rolling!

2. Observe max. permissible support load of trailer coupling, drawbar or hitch!

3. With drawbar towing, ensure adequate mobility at the drawbar connection point!

Power take-off shaft operation

1. Only the powershafts specified by the manufacturer may be used!

2. The protective pipe and funnel guard of the powershaft and the power take-off shaft guard must always be fitted and fully functional!

3. In the case of powershafts, ensure observance of the specified pipe overlaps in transit and working positions!

4. The powershaft must only be mounted and removed with the power take-off shaft and the engine switched off, and with the ignition key removed!

5. When using powershafts with overload or freewheel clutches which are not covered by the protective guards on the tractor, overload or freewheel clutches must be attached on the machine side!

6. Always ensure correct assembly and securing of the powershaft!

7. Secure the powershaft guard against being pulled along by attaching the chain!

8. Before switching on the power take-off shaft, ensure that the selected speed and direction of rotation of the tractor power take-off shaft correspond to those of the machine, as shown on the serial plate!

9. Before switching on the power take-off shaft, ensure that no one is in the danger area of the machine!

10. Never switch on the power take-off shaft with the engine switched off!

11. When working with the power take-off shaft, no one must be allowed in the area of the rotating shaft or the powershaft!

12. Always switch off the power take-off shaft if excessive offset angles of the pto-shaft occur, or when it is not required!

13. Caution: when the power take-off shaft has been switched off, danger from running-on as a result of centrifugal mass! During this time the machine must not be approached too closely. Work may only be carried out on the machine when all machine parts have come to a standstill!

14. Cleaning, lubrication or setting of the power take-off shaft driven machine or of the powershaft only with the power take-off shaft and the engine switched off, and with the ignition key removed!

15. Place the decoupled powershaft on the mounting provided!

16. After removing the powershaft, push the protective sheath onto the stump of the power take-off shaft!

17. Damage to the machine is to be rectified immediately, and the machine should not be used until this has been done!

Hydraulic system

1. The hydraulic system is under high pressure!

2. When connecting hydraulic cylinders, ensure correct connection of the hydraulic hoses!

3. When connecting hydraulic hoses to the tractor hydraulics, ensure that pressure is switched off both on the tractor side and on the machine side!

4. On hydraulic functional links between the tractor and the machine, the coupling sleeve and coupler plug should be clearly marked in order to prevent incorrect operation! If the links are wrongly connected the reverse function results (e.g. raising/lowering) - danger of accidents!

5. Regularly check hydraulic hose lines and replace if damage or ageing has occurred! The replacement lines must meet the technical requirements of the machine manufacturer! The service life of the hose lines should not exceed 6 years, including a storage life of not more than 2 years.

6. When searching for leaks use the proper equipment, otherwise there is danger of injury!

7. Fluids emerging under high pressure (hydraulic oil) may penetrate the skin and cause serious injury! If an injury occurs, see a doctor immediately! Danger of infection!

8. Before working on the hydraulic system, lower all appliances/assemblies, remove the pressure and switch off the engine!

Tyres

1. When working on the tyres it should be ensured that the machine is safely parked and secured against rolling (chocks)!
2. The fitting of tyres and wheels requires adequate knowledge and the proper tools!
3. Repair work to tyres and wheels may only be carried out by specialists using the appropriate tools and equipment!
4. Regularly check the air pressure! Observe specified air pressure!

Maintenance

1. Repair, maintenance and cleaning work, as well as the rectification of malfunctions, should only be carried out with the drive switched off and the engine at a standstill!- Remove the ignition key!
2. Regularly check nuts and screws for tightness, and retighten as necessary!
3. During maintenance work on raised appliances/assemblies, always secure with suitable support elements!
4. When replacing working equipment, use suitable tools and gloves!
5. Properly dispose of oils, greases and filters!
6. Before working on the electrical system, always disconnect the power!
7. If protective guards are subject to wear, they must be checked regularly and replaced at the appropriate times!
8. Spare parts must at least meet the technical requirements specified by the machine manufacturer! This is ensured, for example, by the use of original spare parts!
9. When carrying out electrical welding work on the tractor and hitched appliances, detach cables on the alternator and battery!

Haymaking machinery

1. The haymaker is designed, and suitable for, the processing of mown crop material lying on the ground!

2. When swivelling the drawbar from the transit position to the working position and vice versa, danger of crushing and shearing occurs at specific points! Particular care should be taken during swivelling!

3. Repairs to preloaded energy stores (springs, pressure accumulators etc.) require adequate knowledge and the proper tools, and may only be carried out in specialist workshops!

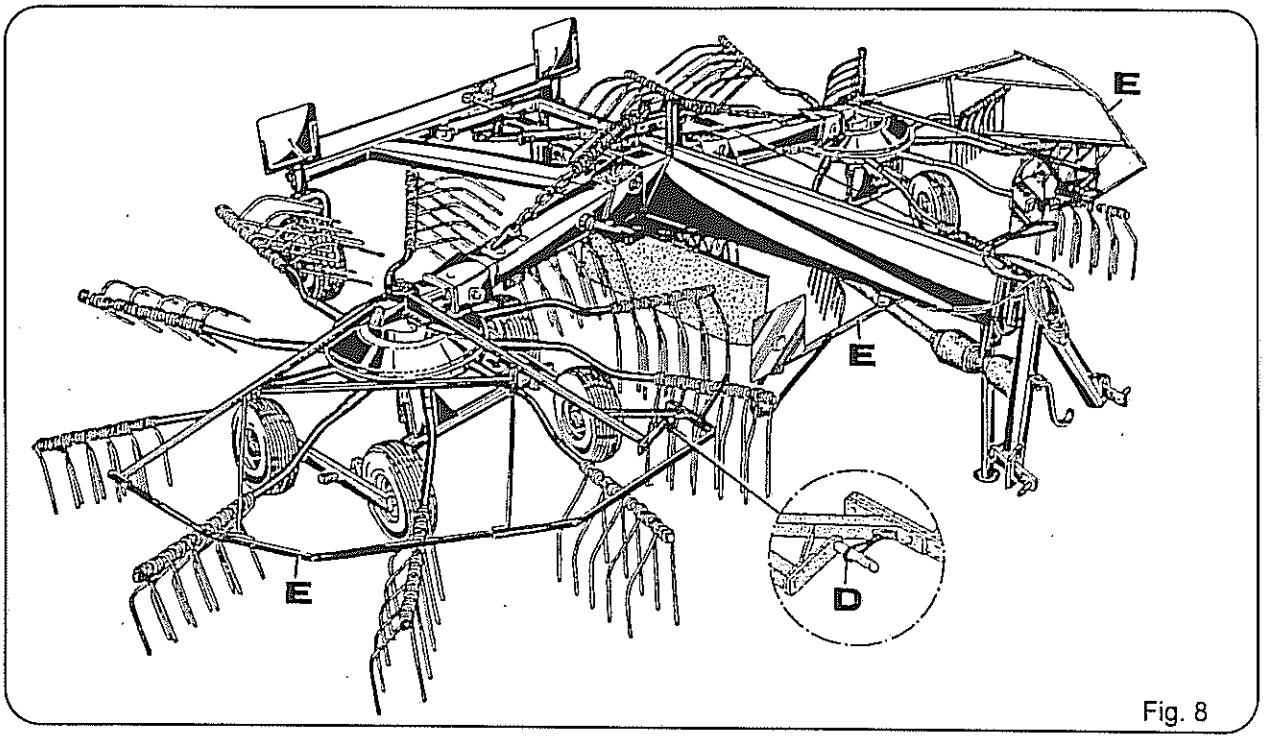


Fig. 8

1. Protecter with crank handles for adjusting the heigth of the rotors and the central hoop guard must be fitted (see Fig. 8, Ref. E. Secure the crank levers on both left and right with a rubber ring (Fig. 8, Ref. D).

2. If public highways are used, the applicable heighway regulations must be obeyed. Warning signs must be correctly fitted and clean, with lighting. The operator is responsible for fitting warning signs.

3. CAUTION! Damaged or bent tines increase the risk of accidents and must be replaced before the unit is used.

4. Always bear in mind that rotating parts of the big swather operate at high speeds. All bearings and moving parts therefore require frequent and thorough lubrication. The functioning and service live of the big swather are directly dependent on proper lubrication and maintenance.

5. Do not allow any persons within the hazard range, due to the danger of objects being thrown out from the machine (see warning signs, Page 20, Ref. A). Exercise particular care on roads and streets.

6. CAUTION! Because the running wheels are steered, the machine follows the track of the tractor. This means that the rear of the big swather will swing outwards in bends.

7. These Operating Instructions must be followed precisely in order to prevent improper use of the machine.

8. Warning signs which have fallen off or become illegible must be replaced by the operator.

Use only ORIGINAL NIEMEYER PARTS. The fitting of replacement parts of other makes can result in major damage and will nullify our warranty.

Copied parts, particularly wearing parts, seldom meet the requirements and visual examination of the quality of the material is not possible.

This is why you must never use parts other than ORIGINAL NIEMEYER parts!

Hydraulic diagram

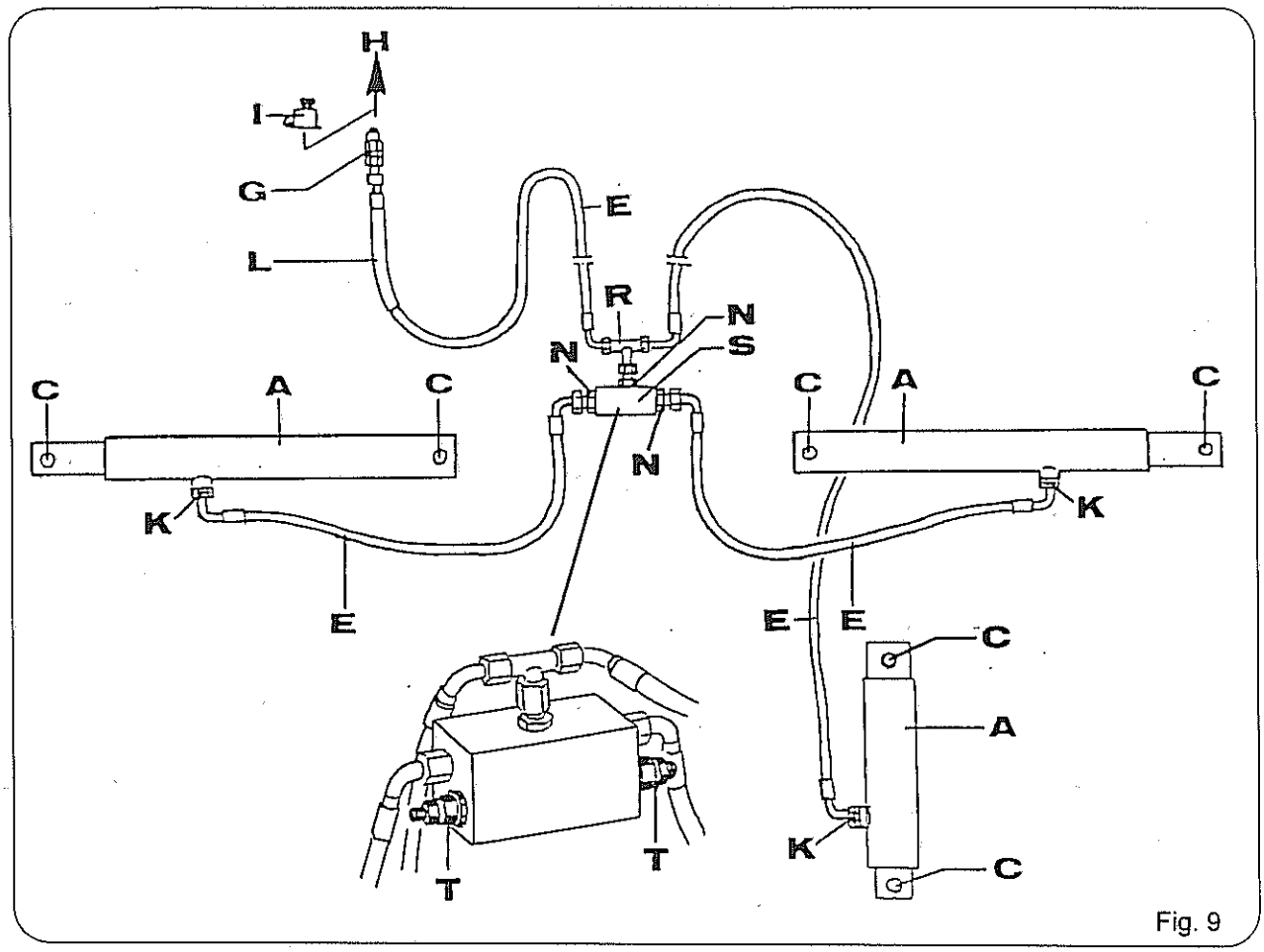


Fig. 9

A = hydraulic cylinder
C = implement connection
E = hydraulic hoses
G = coupling connector
H = tractor
I = connector holder
K = baffle
L = protective tube
N = screwed connection
R = T-type screwed connection
S = valve flow distributor
T = final compensation

The maximum hydraulic pressure is 210 bar

Mounting

Mounting - cardan shaft

The long cardan shaft (Fig. 10, Ref. R) extends forwards on the central gear unit to the intermediate bearing under the carrying frame. It is already size-adapted and mounted.

The short cardan shaft (Fig. 10, Ref. S) connects the tractor to the swather.

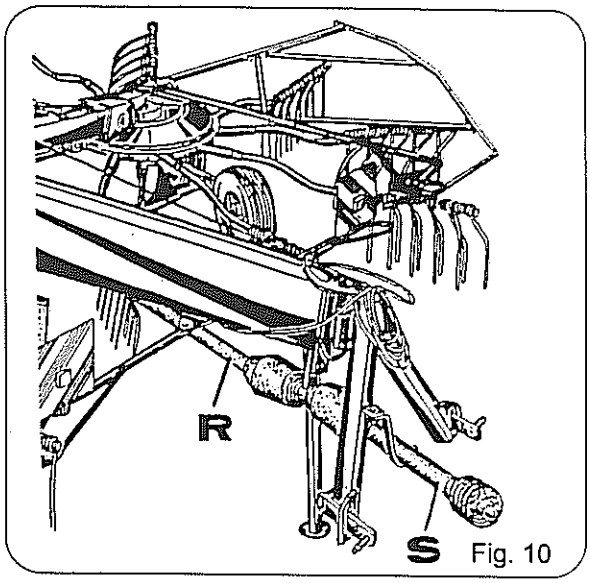


Fig. 10

Before using the implement, check the length of the cardan shaft and shorten if necessary. Travelling through bends and lifting with the tractor hydraulics causes the cardan shaft to telescope in to such an extent that an excessively long cardan shaft can cause damage.

The cardan shaft must not project "overall", nor must it be too short. The metal tubes of the cardan shaft must be set at least 400 mm inside one another.
CAUTION! Otherwise there is a risk of breakage of the cardan shaft.

Measures for shortening the cardan shaft are described in the Cardan shaft Instructions.

To shorten a cardan shaft, the sliding tubes and protective tubes must be sawn off using a metal-cutting saw. The use of disc grinders or similar tools would damage the sliding tubes, due to the amount of heat produced. Following shortening of the shaft, the cutting burr and chips must be removed thoroughly.

Lubrication: Following shortening of the cardan shaft and during the period of operation, the outer sliding tube must be regularly lubricated from the inside.

To protect against accidents, it is essential that the outer protective tubes of the cardan shaft are attached to the frame by chains.

The Cardan shaft Instructions contain important manufacturer's instructions and tips on the use of the cardan shaft.

Mounting on the tractor

Stop the tractor engine and remove the ignition key if mounting necessitates walking between the tractor and the big swather (see Warning Signs Page 20, Ref. F).

Bear in mind the alleviation of the load on the front axle! Remaining load at least 20 % of the tractor weight.

Risk of injury in the area of the three-point linkage and lifting limit of the rear transport cylinder due to crushing and cutting points (see Warning Signs Page 20, Ref. N).

Particular care is therefore required when coupling and decoupling from the tractor.

The hydraulic system is under high pressure.

Before working on the hydraulics, depressurize the system and switch off the engine.

When connecting hydraulic cylinders, the hydraulic hoses must be connected as specified.

All hydraulically actuated parts have cutting and crushing points (see Warning Signs Page 20, Ref. N).

Work on the hydraulic system must be carried out only by a specialist engineer.

The hydraulic rotor lift system may only be operated when there are no persons present within the hazard area (see Warning Signs Page 20, Ref. D).

Check hydraulic lines regularly and replace if damaged or aged (see also Pages 6 and 7 of "Hydraulic System").

It is essential that the mounting categories of the tractor and attached implement are correctly matched.

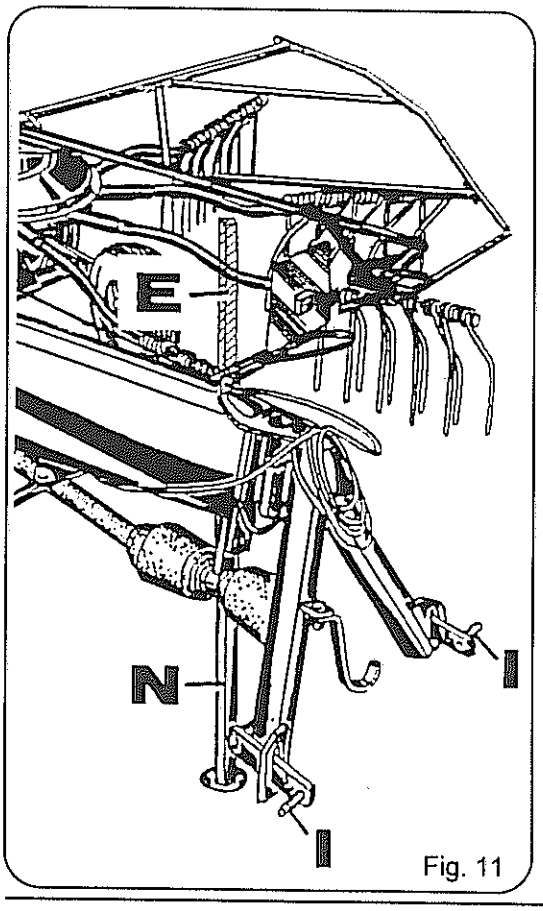


Fig. 11

To transport the big swather, attach the swather to the lower links of the tractor (Fig. 11, Ref. I). Raise the lower links using the three-point hydraulics, then push up the parking support (Fig. 11, Ref. N) and secure with leaf spring connector.

Connect hydraulic hose to a single-action or double-action controller with tractor flow setting

Basic setting

The big swather is set to the basic setting in its working position on firm, level ground, as shown in Fig. 12.

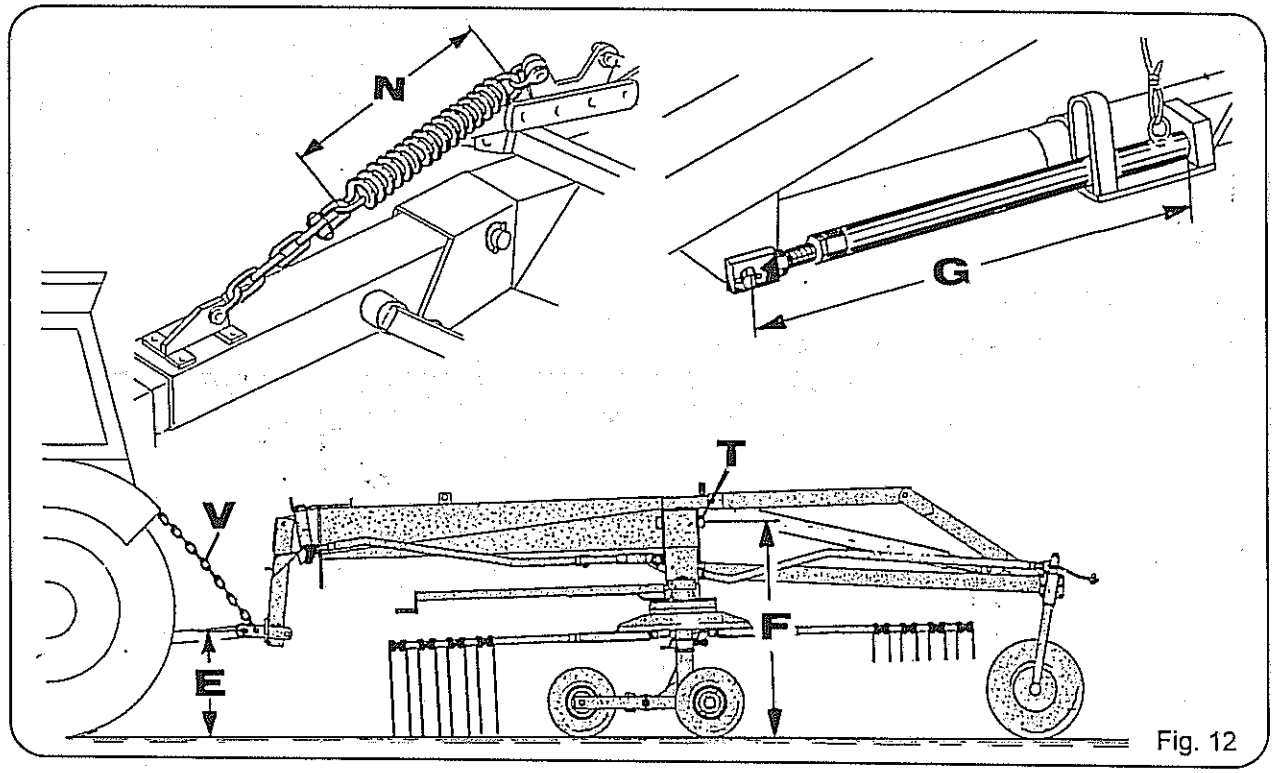


Fig. 12

	E	F	G
TWIN 715-S	approx. 75 cm	approx. 125 cm	approx. 64 cm
TWIN 745-VS	approx. 75 cm	approx. 125 cm	approx. 64 cm
TWIN 850-VS	approx. 80 cm	approx. 125 cm	approx. 64 cm

T = Swivel point of boom

V = Stop chain (accessory part) for tractor with three-point linkage without fixed height setting. First set the correct distance E, then attach the carrying frame stop chain to the tractor so as to maintain the distance E. The stop chain must be attached to the tractor as steeply as possible (otherwise risk of chain breakage).

- Set distance E using tractor lower links
- Pressurize hydraulic cylinder until rotors are raised slightly
- Set distance G using the spindles on the frame support (retighten lock nuts)
- Set hydraulics to flow
- Distance F should now have been achieved
- If not the case, the frame support distance G must be corrected

  to shorten = distance F becomes smaller
  to lengthen = distance F becomes greater

- The rotors must stand parallel to the ground

The dimension N of the two relief springs (Fig. 11) must never exceed 580 mm when the big swather is in the operating position, since otherwise the relief springs will be over-stretched.
If necessary, attach shackle to another chain link.

There is a crush hazard in the area of the swivel points and at the lift limits of the boom arms and the transport cylinder (see Warning Signs Page 20, Ref. N).

Transporting

On public roads and streets, the big swather may only be driven with the rotors swivelled upwards, since otherwise the maximum permissible transport width of 3 m (Road Traffic Licensing Regulations) will be exceeded. The maximum transport height of 4 m (Road Traffic Licensing Regulations) must also be observed (bridges, gate entrances, etc.).

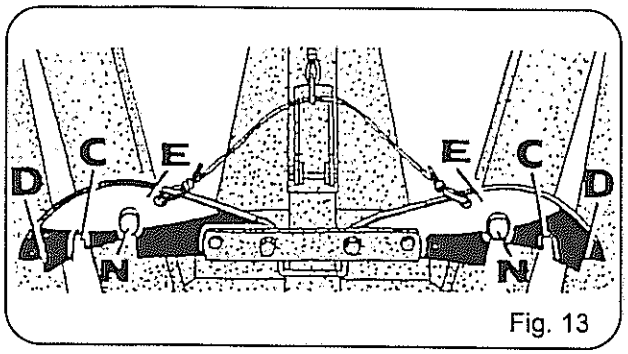


Fig. 13

Release the catches (Fig. 13, Ref. E) using the pull cable and hydraulically raise the rotors until they are in the vertical position and engage in the catch recesses (Fig. 13, Ref. N).

Ensure that the catches are correctly locked in position.

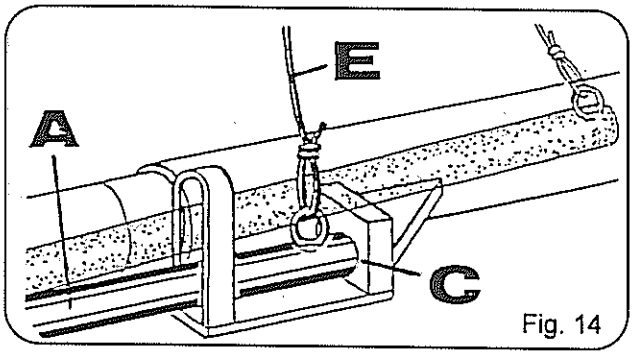


Fig. 14

Operate hydraulic valve on the tractor and raise the frame support (Fig. 14, Ref. A) with the cable (Fig. 14, Ref. E).

Before lowering or transportation, the power take-off shaft must be disconnected and the rotors must be at a standstill.

Slowly lower the machine frame using the tractor hydraulics (Fig. 15).

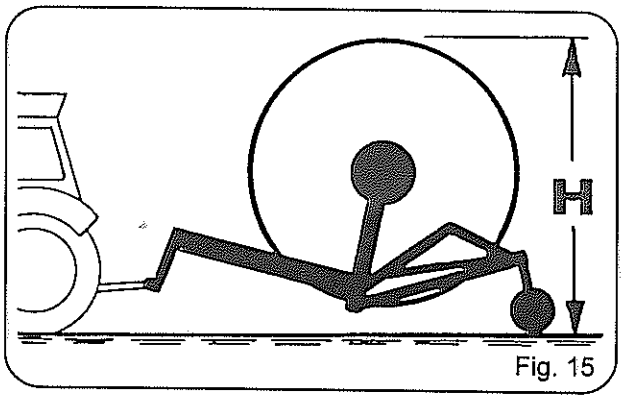


Fig. 15

The reference distances S (Fig. 15) for transportation are as follows:

TWIN 715-S	=	approx. 3.40 m
TWIN 745-VS	=	approx. 3.35 m
TWIN 850-VS	=	approx. 3.75 m

On the TWIN 850-VS, fold in the outer hoop guards.

The machine can be transported following connection of the cardan shaft.

In the case of the TWIN 850-VS, the outer hoop guards must be folded in so as to comply with the transport height limit of 4 m.

There is a danger of crush injury in the area of the lift limit (Fig. 14, Ref. C) and hydraulic cylinders (see Warning Signs Page 20, Ref. F).

Before transporting the machine on public roads and streets, it must be ensured that the catches (Fig. 13, Ref. N) are correctly locked in position and that warning signs are clean and fitted with lighting.

There is a danger of crush injury in the area of the swivel points and at the lift limits of the boom arms and the transport cylinder (see Warning Signs Page 20, Ref. N).

Persons must not come within the swivelling or operating range of the machine (see Warning Signs Page 20, Ref. D).

Operation of the big swather

Before carrying out any work on the big swather, switch off the tractor engine, remove the ignition key and disconnect the tractor power take-off shaft (see Warning Signs Page 20, Ref. F).

The big swather rakes the forage together, so that a swath is formed centrally under the machine.

The big swather is mounted on to the lower links of the tractor. The upper link is not used.

The tractor lower links must be locked in position laterally before the machine operated.

Ensure that an adequate safety distance is maintained from the swivelling range of the machine (see Warning Signs Page 20, Ref. D).

No persons must come within the area of the working machine when the engine is running (see Warning Signs Page 20, Ref. A).

The rotational speed of the tractor power take-off shaft must match the specified engine revs (see rating plate).

Never exceed the maximum rotational speed for the machine.

Raise the machine frame using the tractor hydraulics.

Check:
Frame support must be in the position shown (Fig. 16. Ref. A).

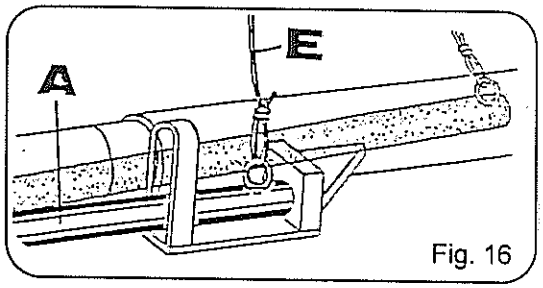


Fig. 16

Release the catches using the cable pull from the tractor and lower the rotors hydraulically until the running wheels under the rotors are on the ground.

Using the crank handles on both the right and left sides (Fig. 17, Ref. E), set the rotors so that the tines are just out of contact with the ground. Following the adjustment, re-secure the crank handles with rubber rings.

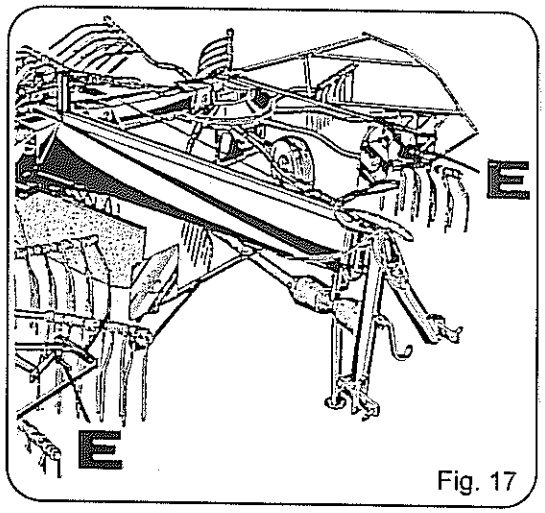


Fig. 17

TWIN 745-VS and
TWIN 850-VS only

Set the required working width using the right and left adjusting levers (Fig. 18, Ref. T). The rotors must be swung up before adjustment.

When lowered, the rotors move into the required working position.

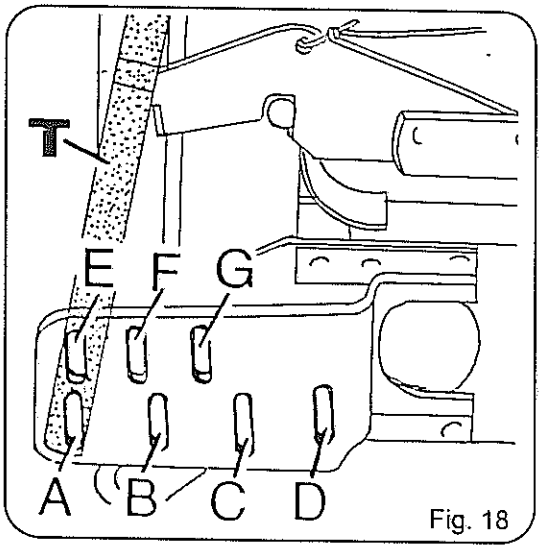


Fig. 18

Working width:
TWIN 745-VS from hole A = 7.40 m to hole G = 6.70 m
TWIN 850-VS from hole A = 8.20 m to hole G = 7.50 m

To set the adjusting levers in holes E, F and G, it is necessary to re-set their screwed mounting positions. There is no hole D on the TWIN 850-VS.

Move folded in hoop guards back into position.

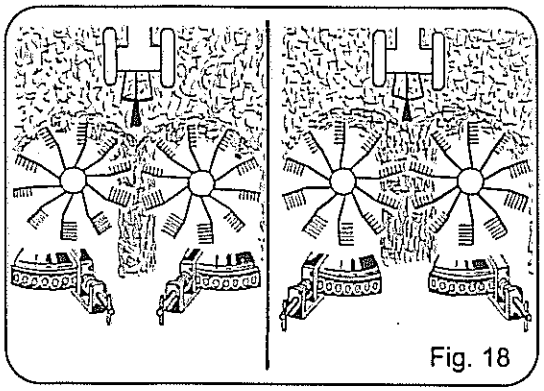


Fig. 18

The cam plate (quadrants under the rotors, Fig. 18) can be turned to adapt the swath lay to particular types of forage and different speeds.

When the machine is raised for the purpose of adjusting the cam plate, it is essential that the machine is supported and secured to prevent it from dropping accidentally.

The travel speed and rotational speed of the power take-off shaft must be selected so that all the forage crop is raked up cleanly by the tines. Optimum operation of the swather is achieved with a power take-off shaft speed of approximately 450 rpm.

To form a swath using only one rotor, lock one of the two rotors in the outer recess using the transport catch (Fig. 19, Ref. C). The raised rotor will continue to rotate as the other operates.

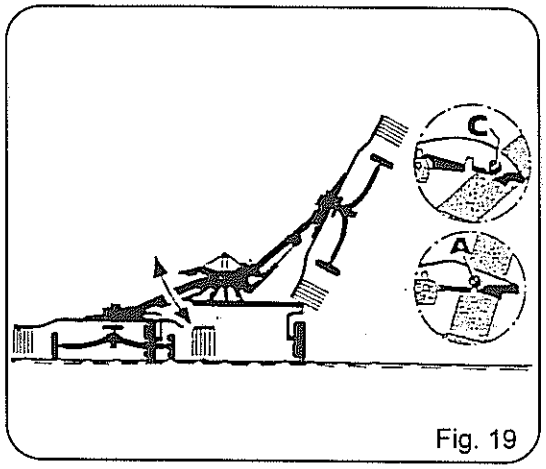


Fig. 19

The raised rotor must be lowered before the swath-forming rotor can be raised. Both rotors can then be raised together.

Ensure that the catches are correctly locked in position.

Fault detection

Correction of unevenly raised rotors

To set and correct the final compensation on the flow distributor (Fig. 20):

- Unscrew lock nuts (V)
- Using a wrench, slacken or tighten adjusting screws (U) by one quarter of a turn. If a screw is screwed in too far, one rotor will drop down. If a screw is not screwed in sufficiently, no further compensation is possible when the catches are in the limit stop position (flow distributor has absolutely no flow).
- Following turning of the adjusting screw by one quarter turn, retighten the lock nut.

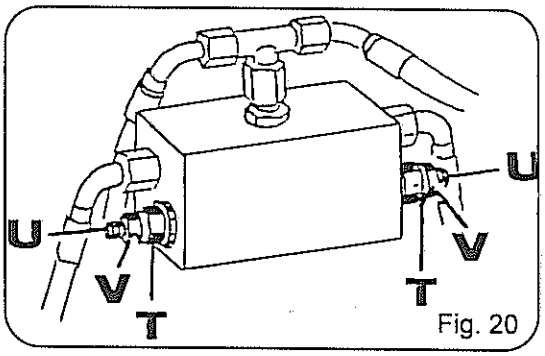


Fig. 20

If the uneven raising of the rotors remains uncorrected, the procedure must be repeated.

Both rotors can be raised slightly during operation using the hydraulics in order to travel over swaths lying crosswise on the headland.

The stop on the locking catches (see Page 14, Fig. 13, Ref. D) automatically limits the lift height. There is no need to switch off the drive.

Do not touch any moving machine parts. Wait until the machine has come to a complete standstill (see Warning Signs Page 20, Ref. E).

The big swather can also be used to rake together several straw swaths to form one swath.

Adjustable running wheel

The running gear under the rotor is equipped with a flange coupling. The running wheel can be moved steplessly upwards and downwards by approximately 1.5 cm in longitudinal holes (Fig. 21).

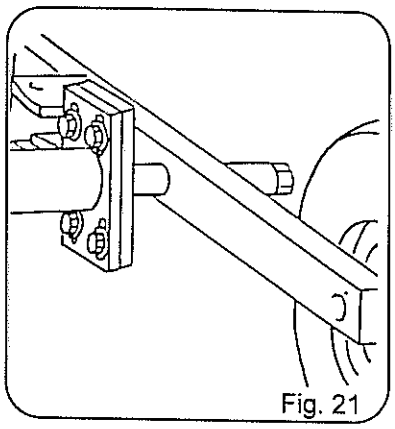


Fig. 21

This permits even raking on the left and right sides of the rotor, adapted according to the forage conditions.

Following adjustment, the screws must be firmly retightened. Tightening moment = **41 Nm**.

This adjustment requires raising the machine. It is essential to secure the big swather to prevent it from dropping accidentally.

Overload cut-out

If the cardan shaft overload cut-out trips repeatedly (e.g. if the forage is too thick), a slower gear must be selected. If the overload cut-out trips for more than 10 seconds, stop operation immediately and ascertain the cause, to prevent damage to the overload coupling.

Parking the big swather

The big swather must be parked on level, firm ground with the rotors raised (transport position).

- Put the machine in the transport position.
- Allow the catches to engage as shown in Fig. 22. Ensure that they are correctly locked in position.
- Pull out parking support and secure (see Page 12, Fig. 11).
- Remove the cardan shaft from the tractor and place in the holder provided (Page 11, Fig. 10, Ref. S)
- Disconnect hydraulic connector and insert in the dummy coupling on the carrying frame.
- Disconnect the lighting cable connector from the tractor.

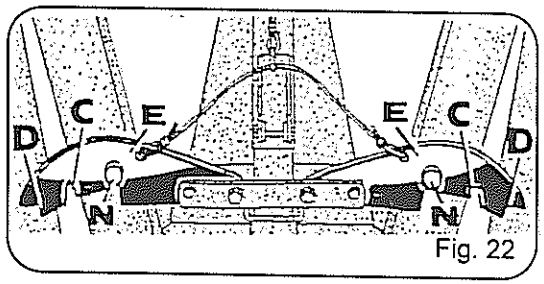


Fig. 22

The hydraulic cylinder piston rods must be cleaned and protected with acid-free grease both at the end of harvesting and if the machine is parked outside for a relatively long period.

An even lower parking height can be achieved as follows:

- Raise the parked big swather using the lifting device (front loader) on the carrying frame.
- Push in parking support fully and secure.
- Re-lower the big swather.

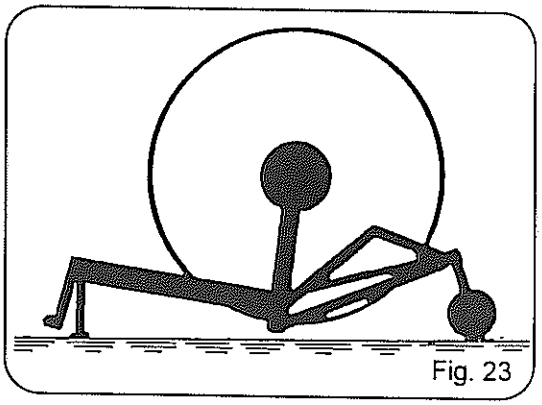


Fig. 23

Maintenance and servicing

Before carrying out any maintenance or repair work, stop the tractor engine and remove the ignition key (see Warning Signs Page 20, Ref. F).
If the work involves raising the machine, it is essential that the machine is secured to prevent it from dropping accidentally.

All bearings are sealed in such a way that the machine can be cleaned by water jet following each operating session.

All screws must be checked for correct seating following the first use of the machine and then after an operating period of approximately 2 hours. Tighten screws if necessary.

Maximum torque for hexagon head screws with standard metric ISO thread

Thread diameter	Torque M in NM				
	5.6	6.9	8.8	10.9	12.9
M 5	2,8	5	6	8,5	10
M 6	4,7	8,5	10	14	17
M 8	12	21	25	35	41
M 10	23	41	49	69	83
M 12	40	72	86	120	145
M 14	64	115	135	190	230
M 16	100	180	210	295	355
M 18	135	245	290	405	485
M 20	190	345	410	580	690
M 22	260	465	550	780	930
M 24	330	600	710	1000	1200
M 27	500	890	1050	1500	1800
M 30	670	1200	1450	2000	2400

To ensure that screws and nuts are correctly seated, they must be properly tightened by means of a torque wrench. The table shows the required screw tightening moment.
Example: An M 8 screw of the strength classification 8.8 should be tightened with a tightening moment of 25 Nm = 2.5 kpm. The strength classification is stated on the screw head.

Lubrication diagram

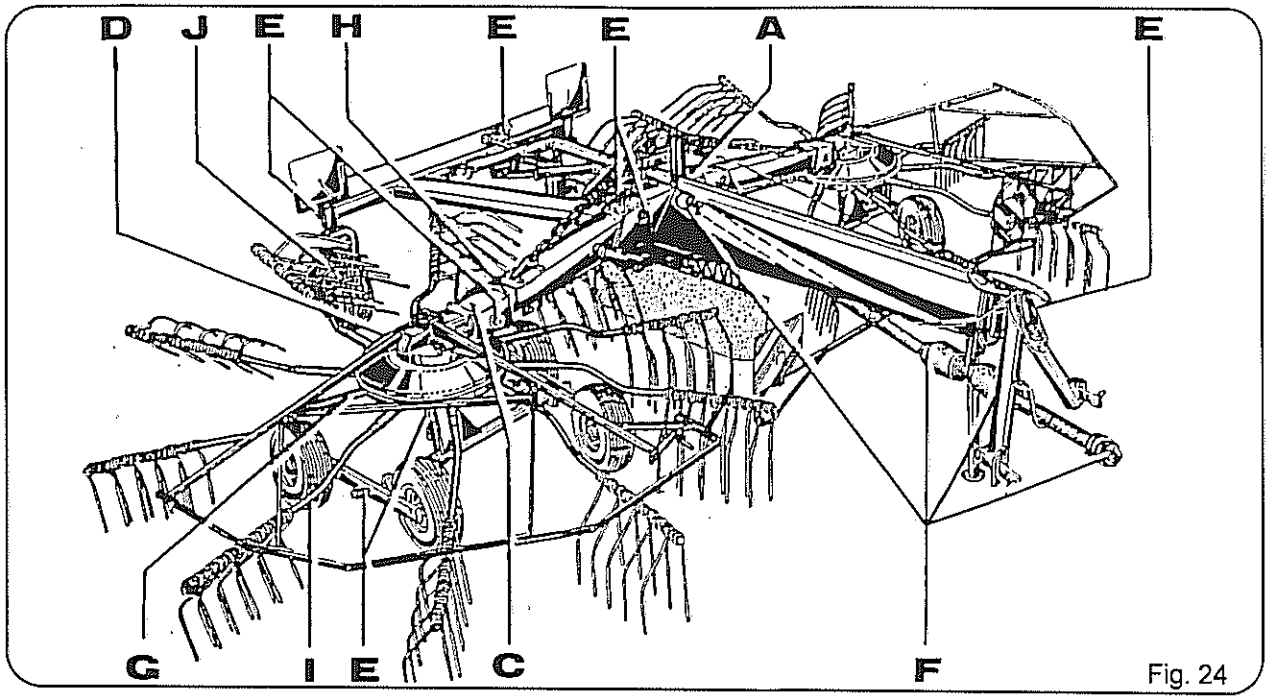


Fig. 24

Before the machine is used for the first time, the rotor gear units (Fig. 24, Ref. D) must be lubricated with a high-grade lubricating grease (lubricating nipples on the gear unit). To achieve a better distribution of the grease, rotate the rotors slowly by hand. Subsequent lubrication approximately every 8 operating hours.

Before operation, all tine carriers (Fig. 24, Ref. G) must be lubricated so that the grease emerges from both sides of the bearing. During the period of operation of the machine, the tine arm bearings and all other lubrication points provided with lubrication nipples (Fig. 24, Refs. C, E and F) must be adequately lubricated with grease on a weekly basis.
C = lubrication nipple on the universal joint and F = lubrication nipple on the cardan shaft universal joint.
All locking and swivelling pins and multi-spline profiles must also be lubricated weekly.

The central gear unit is filled with liquid grease. The filling plug is located on the top of the central gear unit (Fig. 24, Ref. A). Before the start of each season, the operator must ensure that the gear units are correctly lubricated and top up with liquid grease if necessary.

The hydraulic cylinder piston rods must be cleaned and protected with acid-free grease both at the end of harvesting and if the machine is parked outside for a relatively long period.

To increase the service life of the machine it is recommended to apply an adhesive grease when fitting the guide lever and subsequently, at intervals, to the cam plate in the area of the rollers.

Maintenance plan

All screws must be checked for correct seating following the first use of the machine and then after an operating period of approximately 2 hours. Tighten screws if necessary.

The rotor running wheels have pneumatic tyres (Fig. 24, Ref. I) which require an inflation pressure of 1.5 bar. The running gear wheels (Fig. 24, Ref. J) require a pressure of 2.0 bar. All wheels must be checked regularly for correct air pressure.

Warning signs (pictograms)

The operator must replace any warning signs which have fallen off or become illegible.
The pictograms can be reordered using the identification numbers shown next to the symbols.
Even final digit (e.g. (646404) = vertical format. Uneven final digit (e.g. 646405) = horizontal format.

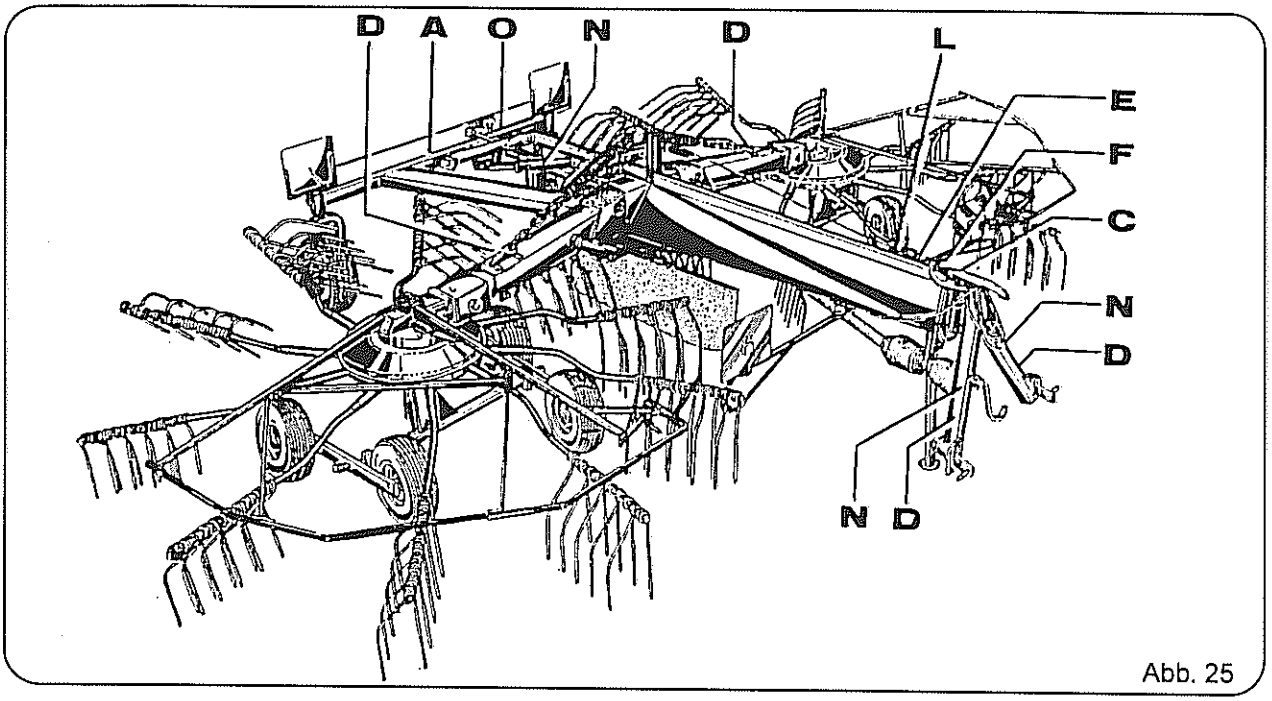
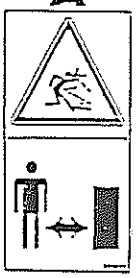


Abb. 25

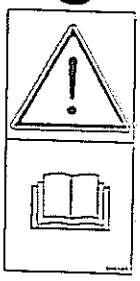
A



646405
646404

Keep distance with motor running.

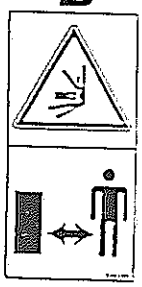
C



646407
646406

Read and pay attention to operating instructions an safety information before starting for the first time.

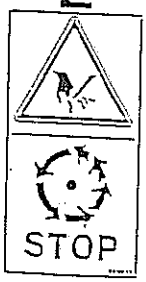
D



646409
646408

Maintain adequate safety distace to the swing aea of the machine

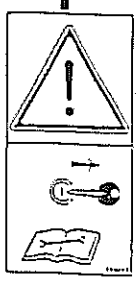
E



646411
646410

Do not touch any moving machine parts. Wait until they have come to a complete standstill.

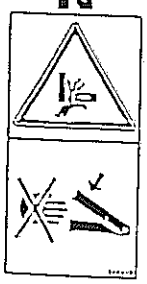
F



646413
646412

Before maintenance or repair work, stop the engine and remove the key.

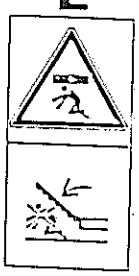
N



646415
646414

Never reach into the crushing danger zone as long as parts are moving there.

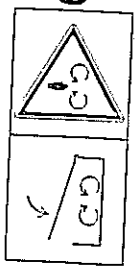
L



646840
646841

Stay clear of swinging area of implemants.

O



646838 1197 ->
646839 1197 ->
1196 ->

Close shields and guards prior to operating the machine.

TWIN 715-VS
TWIN 745-VS
TWIN 850-VS